DESCRIPTION

V–Chip Hours

Field of the Invention

This invention relates to the field of consumer electronics devices, and more particularly to methods and systems for limiting personal exposure to a television system or other consumer electronics device.

Background

There has been long–standing concern on the part of parents or guardians as to the content of programs watched by children and minors. This concern has been long–standing with respect to televisions, and more recently, with respect to on–line services such as, those provided through service providers, such as America Online, or through other electronic means of text and image–based communication.

Various attempts have been made to limit access by children to subject matter that is deemed inappropriate. Certain locks simply block specific channels, where those channels are either known to or are suspected to carry programming which is deemed unacceptable for viewing by children. Other systems incorporate time–based limitations, for example, where the entire television may not be used during certain hours. Typically, the set time limits would preclude operation of the system during "bedtime" hours or at times ~~which~~ therefor parental supervision does not exist, e.g., after school hours. Yet other lock systems serve to make the entirety of the system unavailable other than to authorized users.

Various attempts have been made to provide more refined lock systems. One attempt, the so–called "V–chip" system, utilizes a coding system indicative of content. For example, a given show may be designated as including adult language, violence or nudity. These indicators are often provided by single letter designators, such as L, V and N, respectively. Other coding systems analogous to movie rating codes, such as G for general audience, PG for parental guidance, R for restricted, etc., may also serve as a censor–based assessment of the content. These content–based designators are carried in television systems over the extended data service (XDS or EDS) system. The adopted standard for NTSC television is the EIA–608 standard. Information which is typically carried in such systems includes the network name, show title, and brief description

of the contents of the show. There are currently proposals to include rating information of the type previously mentioned in the XDS data.

Fig. 1 shows a typical format of EIA–608 standards as a function of time. Initially, a horizontal sync pulse 10 initiates a pulse train. A color burst pulse 12 follows the horizontal sync pulse, and is typically provided for all line scans. Next, a clock run–in–signal 14 serves as a synchronizing signal. A sequence of start bits 16, labeled S1, S2 and S3 follow. As depicted, the pulse train here is shown with pulse S3 being "high" and S1 and S2 being "low." In the extended data service system, various characters are then provided. Character one 18 is composed of bits (labeled B0, B1, B2, B3, B4, B5 and B6) and a parity check bit 22 (labeled P1). Character two 24 is composed of bits (labeled B0, B1, B2, B3, B4, B5, B6 and B7) and a parity check bit 26 (labeled P2) for the byte of character two 24. Typically, the XDS data is carried on a line, which is not visible on the television display, such as line 21.

Fig. 2 shows a schematic drawing of the prior art V–chip system. A television or other display 30 is the ultimate recipient of display information. Initially, some source of information such as a television signal 32 is supplied from any number of sources, such as over–the–air transmission, cable or other recorded source. Channel selection 34 controls the tuner 36 to select the desired information from television signal 32. The output of tuner 36 is an audio/video signal 38 corresponding to the channel selected. A data slicer 40 is coupled to the output of the tuner 36. The data slicer 40 functions to monitor the SCS signal as carried in the audio/video signal 38. The data slicer 40 may either strip the XDS signal from the audio/video signal 38 or simply duplicate the XDS signal. With the V–chip system, the XDS data obtained by the data slicer 40 is program rating information. The program rating information is supplied from the data slicer 40 to the comparator 42. A list 44 of prohibited ratings is stored or provided ~~comprising a list of prohibited ratings~~. Typically, the system would identify all prohibited ratings by level, such as R and X, though a system could utilize logic to prohibit any rating at a given level or above (the convention above meaning more mature or more likely to be prohibited). In the event of coincidence between the output of the data slicer 40 comprising the rating data of the program and the list of prohibited ratings 44, the comparator 42 provides a blocking signal 46 to signal blocking mechanism 48. The signal blocking mechanism 48 functions as a switch, blocking or otherwise scrambling audio/video signal 38, such that the show having the prohibited rating is ~~not displayed~~.

The process of determining whether to block or scramble the audio/video signal 38 requires a certain amount of time to perform, which manifests itself as a delay, typically, when a viewer changes television channels. This delay in time can be avoided by disabling the V–chip system, such that the audio/video signal 38 is automatically sent to the television display 30 without performing the aforementioned analysis. However, this requires the parent to continuously disable the V–chip system during adult viewing and enable the V–chip system during child viewing. This can become quite tedious, and more importantly, leaves open the possibility that the parent may forget to enable the V–chip system when adult viewing has ended.

Summary of the Invention

This present invention comprises novel methods, apparatuses and systems for supervising personal exposure to a consumer electronics device, such as, e.g., a television system, by reviewing programs for a selected content threshold during a finite time period and not reviewing programs for the selected content threshold during another finite time period.

In a preferred method of the present invention, a program signal is received by a consumer electronics device with "V–chip" circuitry, which without intervention would be transformed into user discernible information for exhibition to a user. In the case of a television system, the user discernible information may represent itself as a picture and sound. One or more content–based indicators, such as, e.g., a television or movie rating or a subject matter category, are received. These content–based indicators are indicative of the content of the user discernible information. Timing information, such as, e.g., the current time, is also received. The content–based indicators and timing information can be carried by the program signal itself, or they can originate from some other source. One or more content–based specifications, such as, e.g., a rating or subject matter category, and one or more finite time range specifications associated with each of the content–based specifications can then be selected. Either the user or the ~~manufacture~~ manufacturer can effect selection by programming the content–based specification and associated finite time range specifications into the "V–chip" circuitry.

Each of the received content–based indicators ~~are~~ is then compared to each of the selected content–based specifications when the reference time falls with a selected finite time range. In response to the comparison, a control signal is generated, which either causes the program signal to be impaired (block control signal), for instance by means of blocking or scrambling, or

unimpaired (pass control signal). In the case of a television system, one or more of the video, audio, or closed captioning aspects of the program signal can be impaired. The block control signal can be generated if a received content–based indicator exceeds (if rating) or matches (if categorical) a selected content–based indicator. The pass control signal can be generated if none of the received content–based indicators exceeds (if rating) or matches (if categorical) a selected content–based indicator.

In a preferred embodiment of the present invention, a consumer electronics device includes "V–chip" circuitry comprising a logic unit, non–volatile memory and a signal impairing mechanism. The "V–chip" circuitry can be utilized in a television system, a video cassette recorder, audio equipment, or any consumer electronics device whereby user discernible information can be generated. The "V–chip" circuitry allows the consumer electronics device to transform a program signal into user discernible information if the program signal meets certain ~~content and time based~~ CONTENT-AND-TIME-BASED criteria, and prevents the consumer electronics device from transforming the program signal into user discernible information if the program signal does not meet certain ~~content and time base~~ CONTENT-AND-TIME-BASED criteria.

In this regard, the logic unit is coupled to the non–volatile memory and is configured for performing the following upon execution of instructions stored within the non–volatile memory. The logic unit receives one or more content–based indicators and a reference time, which, if carried by the program signal, can be extracted or copied by a data extraction device, such as, e.g., a data slicer. The logic unit also receives one or more content–based specifications and associated finite time range specifications, which have been selected by either the user or the ~~manufacture~~ MANUFACTURER and stored in the non–volatile memory. The logic unit then compares the received content–based indicators with selected content–based specifications when the reference time falls within one of the selected finite time ranges. The logic unit then generates either a pass control signal or a blocking control signal based on this comparison.

The signal impairing device receives the program signal and is configured for either passing the program signal therethrough without substantial impairment or passing the program signal therethrough with substantial impairment. The signal impairing device is coupled to the logic unit for receiving the control signals therefrom. Upon receipt of the block control signal, the signal impairing device blocks or scrambles the program signal. Upon receipt of the pass

control signal, the signal impairing device passes the program signal through without substantial impairment.

Other and further objects, features, aspects, and advantages of the present invention will become better understood with the following detailed description of the accompanying drawings.

Brief Description of the Drawings

The drawings illustrate both the design and utility of preferred embodiments of the present invention, in which:

Fig. 1 shows the prior art EIA–608 standards, depicting a typical signal as a function of time;

Fig. 2 is a schematic drawing of the prior art "V–chip" system;

Fig. 3 is a schematic drawing of a preferred embodiment of a "V–chip" system constructed in accordance with the present invention;

Fig. 4 is a flowchart showing a preferred method of selecting between blocking or passing a program signal performed in the "V–chip" system of Fig. 3;

Fig. 5 is a menu system that allows a user to program the "V–chip" system of Fig. 3 with content–based specifications and associated finite time range specifications;

Fig. 6 is a detailed depiction of a remote control unit used in conjunction with the menu system of Fig. 5;

Fig. 7 is a simple rating/time contour, which can be generated by programming the "V–chip" system of Fig. 3;

Fig. 8 is a simple rating/time contour with a maximum rating, which can be generated by programming the "V–chip" system of Fig. 3;

Fig. 9 is a multi–tiered rating/time contour, which can be generated by programming the "V–chip" system of Fig. 3;

Fig. 10 is a daytime/nighttime rating/time contour, which can be generated by programming the "V–chip" system of Fig. 3;

Fig. 11 is a daytime/nighttime rating/time contour with a maximum rating, which can be generated by programming the "V–chip" system of Fig. 3; and

Fig. 12 is a program specific rating/time contour, which can be generated by programming the "V–chip" system of Fig. 3.

Detailed Description of the Preferred Embodiments

Fig. 3 shows a schematic representation of a consumer electronics system 100, and in particular a television system, constructed in accordance with a preferred embodiment of the invention. It should be noted that the consumer electronics system 100 is not to be limited to a television system, but can include any type of system that receives information that a parent might find objectionable, such as, e.g., a video cassette recorder (VCR), audio equipment and computer equipment. In general, the television system 100 receives a television program signal S_{TV}, and absent intervention, provides a program P to a viewer in the form of audio/visual information. The television system 100 includes "V–chip" circuitry 102 that can be programmed by a user, such as, e.g., a parent, to selectively limit exposure of any programs to children that the user feels ~~contains~~ contain inappropriate subject matter. In particular, the "V–chip" circuitry 102 can be programmed to block the program P if the content and time of the program P meet certain criteria selected by the user.

In this connection, the television system 100 includes a tuner 104, which receives the television signal S_{TV}, and, under the control of a channel selector 106, provides a program signal S_P at an output. Typically, the television signal S_{TV} includes a broad range of program channels when received via an antenna or directly from cable entering the premises. It is often the case, however, that the television signal S_{TV} received by the tuner 104 has been pre–tuned, for example, through a cable box or video cassette recorder (VCR) (both not shown). In this case, the television signal S_{TV} received by the television system ~~10~~ 100 includes a single program channel. The television system 100 further includes an audio/visual output device 108, which transforms the program signal S_P into the program in the form of a display on a cathode ray tube (CRT) 110 and sound from a speaker 112.

The "V–chip" circuitry 102 of the television system 100 includes a signal blocking mechanism ~~114~~ 115, which is coupled to the output of the tuner 104 to receive the program signal S_P. The signal blocking mechanism ~~114~~ 115 is shown as a simple switch, but can be any mechanism that allows a signal to be selectively passed and blocked. Depending on the state of a control signal received by the signal blocking mechanism ~~114~~ 115, the program signal S_P is either blocked from passing or allowed to pass to the audio/video output device 108. In alternative embodiments, the "V–chip circuitry 102 includes a signal scrambler, which either scrambles the

program signal S_P or passes the program signal S_P to the audio/video output device 108 without impairment thereof.

In this particular embodiment, the program signal S_P not only includes information required to provide the program to the viewer, but also one or more content–based indicators C_I and timing information T_I. The content–based indicators C_I are indicative of the content of the program P, and preferably include a rating, such as, e.g., a television or movie rating, or a subject matter category, such as, e.g., sex or violence. Presently, the Federal Communications Commission (FCC) dictates the following ratings and subject matter categories: television ratings shall include TV–Y, TV–Y7, TV–G, TV–PG, TV–14 and TV–MA; movie ratings shall include G, PG, PG–13, R, NC–17 and X; and the subject matter categories include FV (Fantasy Violence), D (Sexual Dialog), L (Adult Language), S (Sexual Situations) and V (Violence). It can be appreciated by those skilled in the art that the present invention is not limited to the above–disclosed ratings and categories, but can encompass any content–based indicator C_I that provides information allowing an individual to determine the content of a particular program received by the television system 100. The timing information T_I indicates a reference time, such as, e.g., the current time.

The content–based indicators C_I and timing information T_I are incorporated into the program signal S_P, preferably using an extended data service (XDS or EDS) system. It can be appreciated by those skilled in the art that the content–based indicators C_I and timing information T_I can originate from any source dependent or independent from the program signal S_P. For instance, the content–based indicators C_I and timing information T_I can be supplied by the Program Status Information Protocol (PSIP) or an Electronic Program Guide (EPG). The timing information T_I can also originate from within the television system 100 via a user setting. The "V–chip" circuitry 102 further includes a data extraction device 114, which is coupled to output of the tuner 104 to receive the program signal S_P. In this embodiment, the data extraction device 114 is a closed caption data slicer, which monitors the program signal S_P and obtains from it XDS information, namely, the content–based indicators C_I and the timing information T_I.

A ~~program~~ user entry system 116, typically embodied in a remote control unit 118 and a corresponding remote ~~transceiver~~ receiver 120, is the mechanism by which a user inputs one or more content–based specifications C_S and one or more finite time range specifications T_S associated with the content–based specifications C_S. The content–based specifications C_S are indicative of

the content of any program P that the user wishes to limit, and like the content–based indicators C_I, the content–based specification C_S can be selected from a variety of content ratings and subject matter categories. The associated finite time range specifications T_S are the time ranges during which the user wishes to limit the content of any program P. The "V–chip" circuitry 102 includes non–volatile memory 122, which is coupled to the program entry system 116 for receiving and storing the content–based specifications C_S and associated finite time range specifications T_S in a look–up list 124. Preferably, the non–volatile memory 122 is embodied in Flash Memory or an EEPROM.

The "V–chip" circuitry 102 further includes a logic unit 126 to generate either a block control signal $CTRL_{BLOCK}$, which causes the signal blocking mechanism 115 ~~114~~ to preclude the program signal S_P from being passed effectively to the audio/video output device 108, or a pass control signal $CTRL_{PASS}$, which permits the program signal S_P to be passed via the signal blocking mechanism 115 ~~114~~ to the audio/video output device 108. In the preferred embodiment, the logic unit 126 is preferably implemented as a microprocessor. While an integrated device is preferable, any analog or digital system, discrete or integrated, or combinations thereof may be utilized if the functionalities of the invention may be achieved. For expository convenience, the logic unit 126 will be identified as a comparator, though the label comparator is not intended to exclude other logic combinations or functionalities.

The logic unit 126 is coupled to the output of the data slicer 114 to receive the extracted content–based indicators C_I and the current time T_I, and the non–volatile memory 122 to receive the content–based specifications C_S and associated finite time range specifications T_S. The logic unit 126 compares the content–based indicators C_I with the content–based specifications C_S when the current time T_I falls within the associated finite time range specifications T_S, and generates a control signal CTRL in response thereto, which either constitutes a block control signal $CTRL_{BLOCK}$ or a pass control signal $CTRL_{PASS}$. The logic unit 126 is coupled to a clocking signal CLOCK, which allows the control signal CTRL to be periodically updated, preferably, during every frame of the program signal S_P (about every 16 ms). The control signal CTRL can, however, be updated less frequently, e.g., every second or every minute.

Referring to Fig. 4, operation of the logic unit 126 is explained in further detail. At step 130, the control signal CTRL generated by the logic unit 126 either indicates BLOCK or PASS. When the control signal CTRL indicates BLOCK, the signal blocking mechanism 115 ~~114~~ blocks

the program signal S_P from being sent to the audio/video output device 108. For the purposes of this specification, it should be understood that blocking the program signal S_P entails blocking at least one of the video, audio and captioning aspects of the program signal S_P. Preferably, however, all three of these aspects are blocked, such that the picture, sound and captioning will not be output from the audio/video output device 108. When the control signal CTRL indicates a PASS, the signal blocking mechanism ~~114~~ 115 sends the program signal S_P to the audio/video output device 108, such that the picture, sound and captioning are output.

At step 132, the logic unit 126 waits for a time queue from the clock signal CLOCK, and upon receipt of the time queue, the logic unit 126 determines, at steps 134 and 136, whether the "V–chip" circuitry 102 has been enabled by determining whether the current time T_I falls within any of the time range specifications T_S. In particular, the logic unit 126 determines, at step 134, the current time T_I obtained from the program signal S_P and any time ranges specifications T_S obtained from the look–up list 124. The logic unit 126 then determines, at step 136, whether the determined current time T_I falls within any of the determined time range specifications T_S. If the current time T_I does not fall within any of the determined time range specifications T_S, ~~and~~ the logic unit 126, at step 138, generates a pass control signal $CTRL_{PASS}$, thereby passing the program signal S_P to the audio/video output device 108. Thus, the "V–chip" circuitry 102 is disabled. If the current time T_I does fall within any of the determined time range specifications T_S, the logic unit 126 analyzes the content–based indicators ~~CI~~ C_I vis-à-vis the content–based specifications ~~C8~~ C_S. Thus, the "V–chip" circuitry 102 ~~enabled~~ is enabled. Of course, the television system 100 may be configured, such that the "V–chip" circuitry 102 may be enabled or disabled independently from the time range specifications T_S. For instance, the "V–chip" circuitry 102 may be optionally operated in a standard analysis mode, whereby the "V–chip" circuitry 102 can be enabled to automatically analyze the content–based indicators C_I vis-à-vis the content–based specifications C_S without regard to time, or disabled to automatically pass the program signal S_P to the audio/video output device 108. For ease of illustration, details concerning this feature will not be set forth.

If the "V–chip" circuitry 102 is found to be enabled, the logic unit 126 determines, at step 142, the content–based indicators C_I obtained from the program signal S_P and the content–based specifications C_S corresponding to those time range specifications T_S in which the current time T_I falls. At steps 140 and 142, the content–based indicators C_I are compared with the content–based

specifications C_S. In the case of program ratings, if any of the content–based indicator C_I ratings exceed any of the content–based specification C_S ratings (typically, there will be a maximum of two content–based specification C_S ratings — a television rating and a movie rating), the logic unit 126, at step 140, generates a block control signal $CTRL_{BLOCK}$, thereby blocking the program signal S_P from being sent to the audio/video output device 108. If any of the content–based indicator C_I ratings do not exceed any of the content–based specification C_S ratings, the logic unit 126 goes to step 144.

If any of the content–based indicator C_I categories matches any of the content–based specification C_S categories, the logic unit 126, at step 140, generates a block control signal $CTRL_{BLOCK}$, thereby blocking the program signal S_P from being sent to the audio/video output device 108. If none of the content–based indicator C_I categories matches any of the content–based specification C_S categories, the logic unit 126, at step 138, generates a pass control signal $CTRL_{PASS}$, thereby passing the program signal S_P to the audio/video output device 108. The logic unit 126 then proceeds to step 130, where the analysis process is repeated. The logic unit 126 performs the aforementioned steps by executing instructions that preferably take the form of computer software stored in the memory 122 or other suitable storage medium, such as, e.g., a ROM chip, or fixed logic, such as, e.g., an ASIC.

Programming of the content–based specifications C_S and associated finite time range specifications T_S into the "V–chip" circuitry 102, and in particular the look–up list 124 of the non–volatile memory 122, is preferably effected through the use of a menu system 150, shown in Fig. 5. As depicted, the menu system 150 includes an array of menus, which includes a main menu 152, a "V–chip" password entry screen 154, a "V–chip" main menu 156, a television ratings menu 158, a movie ratings menu 160, a subject matter categories menu 162 and a time range menu 164.

The user entry system 116, and in particular the remote control unit 118 (shown in detail in Fig. 6), is the operative device through which the user can interact with the menu system 150. The remote control unit 118 includes a menu key 166, adjust thumb disc 168, enter key 170 and numeric keys 172 to allow the user to input selected information via the menu system ~~162~~ 150. Depression of the menu key 166 displays the main menu 152 when the television system 100 is in a home state (i.e., normal operation of the television system 100). If the main menu 152 is displayed, subsequent depression of the menu key 166 returns the user back to the home state.

If one of the submenus is displayed, depression of the menu key 166 displays the previous menu. The adjust thumb disc 168 allows the user to scroll up, down, left or right within the menu system ~~162~~ 150 to select a particular menu item. Depression of the enter key 170 allows the user to enter a selected menu item into the non–volatile memory 122.

Within the main menu 152, the user can select the "V–chip Parent Lock" menu item, which takes the user to the "V–chip" password entry screen 154. A password, preferably known only by the parents, is entered via the numeric keys 172. If the correct password is entered, the user is taken to the "V–chip" main menu 156. If an incorrect password is entered, the user is not taken to the "V–chip" main menu 156, and the words "try again" are displayed. In the "V–chip" main menu ~~152~~ 156, the user can select V–CHIP ON or V–CHIP OFF to alternately enable and disable the "V–chip" circuitry 102. If the user selects V–CHIP ON, the user can then select V–CHIP HOURS ON or V–CHIP HOURS OFF to alternately enable the "V–chip" circuitry 102 to analyze the program signal with regard to time, and disable the "V–chip" circuitry 102 to analyze the program signal without regard to time. The "V–chip" main menu ~~152~~ 156 can also be used to select the type of content–based specification C_S to be entered into the look–up list 124. That is, the user can select TV RATINGS, MOVIE RATINGS, or CATEGORIES, to take the user respectively to the television ratings menu 158, movie ratings menu 160, or subject matter categories menu 162. Preferably, the menu ~~system 162~~ system 160 requires the user to first select a content–based specification C_S, and then a time range specification T_S associated with the selected content–based specification C_S. However, it should be appreciated that the menu system ~~162~~ 150 can be configured to require selection of the time range specification T_S followed by selection of the content–based specification C_S without straying from the principles taught by this invention.

Within the television ratings menu 158, the user can select a particular television rating, which prevents any program P exceeding the selected television rating from being output from the audio/video output device 108. The television ratings can be selected from the following: OFF, TV–Y, TV–Y7, TV–G, TV–PG, TV–14 and TV–MA. A selection of OFF removes the previously selected content–based specification C_S television rating and corresponding time range(s) from the look–up list 124. A selection of any of the television ratings stores the selected television rating, as a content–based specification C_S, in the look–up list 124. Since a selection of a particular rating is effectively also a selection of all ratings below the selected rating, a

selection of TV–MA is effectively the same as selecting OFF. As will be described in further detail below, however, selection of TV–MA affects the selection of the subject matter categories.

Within the movie ratings menu 160, the user can select a particular ~~television~~ MOVIE rating, which prevents any program P exceeding the selected movie rating from being output from the audio/video output device 108. The movie ratings can be selected from the following: OFF, G, PG, PG–13, R, NC–17 and X. A selection of OFF removes the previously selected content–based specification C_S movie rating and corresponding time range(s) from the look–up list 124. A selection of any of the movie ratings stores the selected movie rating, as a content–based specification C_S, in the look–up list 124. Selection of X is effectively the same as selecting OFF.

Within the subject matter categories menu 162, the user can select either to allow or block any program P from being sent to the audio/video output device 108 when the program P contains subject matter falling within the selected subject matter category. The subject matter categories can be selected from the following: FV (Fantasy Violence), D (Sexual Dialog), L (Adult Language), S (Sexual Situations), V (Violence) and Non–Rated Programs. A selection to allow a particular category, removes the content–based specification C_S corresponding to that category from the look–up list 124. Conversely, a selection to block a particular category stores the selected category, as a content–based specification C_S, in the look–up list 124.

As currently dictated by the FCC, certain subject matter categories ~~cannot~~ can be selected only if certain television ratings have been selected. For instance, category FV can only be selected if TV–Y7 has been selected. Category D can only be selected if TV–PG or TV–14 has been selected. Categories L, S and V can only be selected if TV–PG, TV–14 or TV–MA has been selected. Thus, the selection of categories enhances the television rating selected by the user. For instance, if television rating TV–14 and category S is selectively allowed, then all programs rated TV–MA are blocked and all programs containing sexual ~~situation~~ situations are blocked. Thus, the discretionary aspect of a selected television rating can be supplemented by further selecting a subject matter category. In this case, the following combinatory content–based specifications C_S can be created: TV–Y7 FV, TV–PG D, TV–PG L, TV–PG S, TV–PG V, TV–14 D, TV–14 L, TV–14 S, TV–14 V, TV–MA L, TV–MA S and TV–MA V. Some programs, such as, e.g., news and sports, are not rated or are un–rated. In this case, the user can select to allow all non–rated programs or block all non–rated programs. If the TV rating is OFF, non–rated programs cannot be selected.

After a particular content–based specification C_S is selected, the user is brought to the time range menu 164 wherein the user can define one or more time range specifications T_S to be associated with the selected content–based specification C_S. The time range specification T_S can be defined by entering a time into the V–CHIP START TIME entry and entering a time into the V–CHIP STOP TIME entry. The defined time range specification T_S is then entered in the look–up list 124. Another time range specification T_S associated with the selected content–based specification C_S can be defined by again entering times into the V–CHIP START TIME and V–CHIP STOP TIME entries. Preferably, the time range specification T_S defined can be applied to each work day of the week (M–F) or to the weekends. This can be accomplished by selecting either the WEEKDAY (M–F) or the WEEKEND (S–S) after selection of the time range.

By selecting content–based specifications C_S and corresponding time range specifications T_S, a parent is able to tailor the enablement and disablement of the "V–chip" circuitry 102 around the schedules of a family. For example, Figs. 7–12 depict a variety of rating/time contours 180 that can be programmed into the "V–chip" circuitry 102. Fig. 7 depicts a simple rating/time contour 180(1) that can be programmed into the "V–chip" circuitry 102 by a parent with pre–school children. In this case, the parent specifies a television rating of TV–G and a corresponding time range between 5:00AM and 8:00PM. Thus, between 5:00AM and 8:00PM when the pre–school children are awake, the "V–chip" circuitry 102 analyzes the program signal S_P and prevents the pre–school children from watching any programs with a rating exceeding TV–G. Between 8:00PM and 5:00AM, when the pre–school children are asleep, the "V–chip" circuitry 102 does not analyze the program signal S_P, allowing adults to watch any program without intrusion from the "V–chip" circuitry 102.

Fig. 8 depicts a simple rating/time contour 180(2) with a maximum rating that can be programmed into the "V–chip" circuitry 102 by a parent with pre–school and pre–teen children. In this case, the parent specifies a television rating of TV–G and a corresponding time range between 5:00AM and 8:00PM. Thus, as with the rating/time counter 180(1) described above, the "V–chip" circuitry 102 analyzes the program signal S_P between 5:00AM and 8:00PM when the pre–school children are awake, preventing the pre–school children from watching any programs with a rating exceeding TV–G. The parent also specifies a television rating of TV–PG and a corresponding time range between 12:00AM and 12:00AM. Thus, the pre–teen children are prevented from watching any programs with a rating exceeding TV–PG at any time.

Fig. 9 depicts a multi–tier rating/time contour 180(3) that can be programmed into the "V–chip" circuitry 102 by a parent with pre–school children and pre–teen children, and who wants to watch any program unencumbered by the "V–chip" circuitry 102 when the children are asleep. In this case, the parent specifies a television rating of TV–G and a corresponding time range between 5:00AM and 8:00PM. Thus, as with the rating/time counter 180(1) described above, the "V–chip" circuitry 102 analyzes the program signal S_P between 5:00AM and 8:00PM when the pre–school children are awake, preventing the pre–school children from watching any programs with a rating exceeding TV–G. The parent also specifies a television rating of TV–PG and a corresponding time range between 8:00PM and 10:00PM. Thus, the "V–chip" circuitry 102 analyzes the program signal ~~SP~~ Sp between 8:00PM and ~~10:00PM~~ 12:00AM when the pre–teen children are awake, preventing the ~~pre–teen~~ pre-teen children from watching any programs with a rating exceeding TV–PG. Between 10:00PM and 5:00AM, when the all of the children are asleep, the "V–chip" circuitry 102 does not analyze the program signal S_P, allowing adults to watch any program without intrusion from the "V–chip" circuitry 102.

Fig. 10 depicts a daytime/nighttime rating/time contour 180(4) that can be programmed into the "V–chip" circuitry 102 by a parent with pre–school children, and who particularly wants to watch television during a certain part of the day unencumbered by the "V–chip" circuitry 102. In this case, the parent specifies a television rating of TV–G and a first corresponding time range between 5:00 AM and 9:00 AM and a second corresponding time range between 3:00PM and 8:00PM. Thus, the "V–chip" circuitry 102 analyzes the program signal S_P between 5:00 AM and 9:00AM and 3:00PM and 8:00PM when the pre–school children are awake, preventing the pre–school children from watching any programs with a rating exceeding TV–G. Between 9:00AM and 3:00PM, when the pre–school children are either asleep or otherwise away from the television ~~system 102~~ SYSTEM 102, the "V–chip" circuitry 102 does not analyze the program signal S_P, allowing adults to watch any program without intrusion from the "V–chip" circuitry 102. Additionally, between 8:00 PM and 5:00 AM, when the pre–school children are asleep, the "V–chip" circuitry 102 does not analyze the program signal S_P, allowing adults to watch any program without intrusion from the "V–chip" circuitry 102.

Fig. 11 depicts a daytime/nighttime rating/time contour 180(5) with a maximum rating that can be programmed into the "V–chip" circuitry 102 by a parent with pre–school and pre–teen children, and who particularly wants to watch television during a certain part of the day

unencumbered by the "V–chip" circuitry 102. In this case, the parent specifies a television rating of TV–G and a first corresponding time range between 5:00AM and 9:00AM and a second corresponding time range between 3:00PM and 8:00PM. Thus, like the rating/time contour 180(4), the "V–chip" circuitry 102 analyzes the program signal S_P between 5:00AM and 9:00AM and 3:00PM and 8:00PM when the pre–school children are awake, preventing the pre–school children from watching any programs with a rating exceeding TV–G. Between 9:00AM and 3:00PM, when the pre–school children are either asleep or otherwise away from the television system 100 ~~system 102~~, the "V–chip" circuitry 102 does not analyze the program signal S_P, allowing adults to watch any program without intrusion from the "V–chip" circuitry 102. ~~The parent also specifies a television rating of TV–PG and a corresponding time range between 8:00PM and 5:00AM, preventing the pre–teen children from watching any programs with a rating exceeding TV–PG.~~ INSAT

Fig. 12 depicts a program specific rating/time contour 180(6) with a maximum rating that can be programmed into the "V–chip" circuitry 102 by a parent that wants to prevent anyone from watching a specific program. In this case, the parent specifies a television rating of TV–MA and a corresponding time range between 12:00AM and 12:00AM. Thus, children are prevented from watching any programs with a rating exceeding TV–MA at any time. In addition, the parent specifies a television rating of TV–Y and a corresponding time range between 8:00PM and 9:00PM, which is a time range that corresponds with the time during which the prohibitive program is aired. Thus, no children can watch a program with a rating exceeding TV–Y during that time range.

Although the rating/time contours 180 have been described as being programmed into the "V–chip" circuitry 102 by the user, it can be appreciated that the rating/time contours 180 can be pre–programmed into the "V–chip" circuitry 102 by the manufacturer. In this case, the user can either select or alter a "preset" rating/time contour 180.

Furthermore, for purposes of simplification, the rating/time contours 180 have been described above with respect to only television ratings, and are thus two–dimensional. It can, thus, be appreciated that both movie ratings and subject matter categories can be programmed into the "V–chip" circuitry 102, thereby creating three–dimensional or even four–dimensional contours.

While preferred methods and embodiments have been shown and described, it will be apparent to one of ordinary skill in the art that numerous alterations may be made without departing from the spirit or scope of the invention. Therefore, the invention is not to be limited except in accordance with the following claims.